

## CLAIMS

What is claimed is:

- Sub A1
1. A method comprising:
- 5 receiving a selection of a center of motion for an assembly of computer aided design (CAD) models of a mechanical design;
- receiving a selection of a component of the assembly associated with the selected center of motion;
- determining a range of motion for the component;
- receiving a selection of an origin for a grid pattern;
- 10 automatically generating the grid pattern based upon the determined range of motion; and
- automatically displaying the grid pattern at the selected origin.
2. The method of claim 1 further comprising:
- determining if the range of motion associated with the component has been
- 15 modified; and
- adjusting the grid pattern to ensure that the displayed range of motion of the component is within limits of the grid pattern.
3. The method of claim 1 further comprising:
- receiving an indication of a change in location of the origin of the grid pattern
- 20 to a new location; and
- displaying a grid pattern with its origin at the new location.

4. The method of claim 1 further comprising:  
receiving a selection of an alternate component associated with the selected  
center of motion;

5. determining a range of motion for the alternate component based upon the  
selected center of motion; and  
automatically adjusting the grid pattern to ensure that the range of motion for  
the alternate component is displayed within limits of the grid pattern.

10. 5. The method of claim 1, wherein receiving the selection of the origin of  
comprises receiving at least one of a cursor selection, coordinate location, centroid  
of the geometry piece, and an entity proximity.

6. The method of claim 1, wherein determining the range of motion comprises  
retrieving pre-stored constraints for the component.

7. The method of claim 1, wherein automatically generating comprises  
automatically generating a grid pattern based at least upon one or more user inputs.

15. 8. The method of claim 1, wherein automatically displaying comprises displaying  
a grid pattern having one or more ranges of motion.

9. The method of claim 1, wherein automatically displaying comprises displaying  
at least one of a scale and an indicator.

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FOSTER, TERENCE

10. The method of claim 1 further comprising determining engineering design information based at least upon the determined range of motion.

11. A method comprising:

5 receiving a selection of a component of an assembly of computer aided design (CAD) models of a mechanical design;  
determining a range of motion for the component; and  
automatically displaying a grid pattern based upon the determined range of motion for the component.

10 12. The method of claim 11, wherein receiving comprises receiving a selection of a component associated with a center of motion of the assembly.

13. The method of claim 11, wherein automatically displaying comprises automatically displaying a grid pattern at a received selection of an origin for the grid pattern.

15 14. An article comprising a machine accessible medium having instructions encoded therein, said instructions, which when executed by a machine, receive a selection of a center of motion for an assembly of computer aided design (CAD) models of a mechanical design, receive a selection of a component of the assembly associated with the selected center of motion, determine a range of motion for the component, receive a selection of an origin for a grid pattern, automatically generate

the grid pattern based upon the determined range of motion, and automatically display the grid pattern at the selected origin.

15. The article of claim 14, wherein the executing instructions further determine if the range of motion associated with the component has been modified, and adjust  
5 the grid pattern to ensure that the displayed range of motion of the component is within limits of the grid pattern.

16. The article of claim 14, wherein the executing instructions further receive an indication of a change in location of the origin of the grid pattern to a new location, and displaying a grid pattern with its origin at the new location.

10 17. The article of claim 14, wherein the executing instructions further receive a selection of an alternate component associated with the selected center of motion, determine a range of motion for the alternate component based upon the selected center of motion, and automatically adjust the grid pattern to ensure that the range of motion for the alternate component is displayed within limits of the grid pattern.

15 18. The article of claim 14, wherein the executing instructions receive at least one of a cursor selection, coordinate location, centroid of the geometry piece, and an entity proximity.

19. The article of claim 14, wherein the executing instructions retrieve pre-stored constraints for the component.

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20. The article of claim 14, wherein the executing instructions automatically generate a grid pattern based at least upon one or more user inputs.

21. The article of claim 14, wherein the executing instructions display a grid pattern having one or more ranges of motion.

5 22. The article of claim 14, wherein the executing instructions display at least one of a scale and an indicator.

23. The article of claim 14, wherein the executing instructions further determine engineering design information based at least upon the determined range of motion.

10 24. An article comprising a machine accessible medium having instructions encoded therein, said instructions, which when executed by a machine, receive a selection of a component of an assembly of computer aided design (CAD) models of a mechanical design, determine a range of motion for the component, and automatically display a grid pattern based upon the determined range of motion for the component.

15 25. The article of claim 24, wherein the executing instructions receive a selection of a component associated with a center of motion of the assembly.

26. The article of claim 24, wherein the executing instructions automatically display a grid pattern at a received selection of an origin for the grid pattern.

27. An apparatus comprising:

a machine accessible medium having instructions encoded therein, said instructions, which when executed by a machine, receive a selection of a center of motion for an assembly of computer aided design (CAD) models of a mechanical design, receive a selection of a component of the assembly associated with the selected center of motion, determine a range of motion for the component, receive a selection of an origin for a grid pattern, automatically generate the grid pattern based upon the determined range of motion, and automatically display the grid pattern at the selected origin; and

a processor to execute the instructions.

28. An apparatus comprising:

a machine accessible medium having instructions encoded therein, said instructions, which when executed by a machine, receive a selection of a component of an assembly of computer aided design (CAD) models of a mechanical design, determine a range of motion for the component, and automatically display a grid pattern based upon the determined range of motion for the component; and

a processor to execute the instructions.